1. Choose the interval below that f composed with g at $x = 1$ is in.

$$f(x) = -2x^3 + 2x^2 - 3x \text{ and } g(x) = 2x^3 + 2x^2 - 2x$$

A. $(f \circ g)(1) \in [-36, -34]$

B. $(f \circ g)(1) \in [-19, -13]$

C. $(f \circ g)(1) \in [-10, 3]$

D. $(f \circ g)(1) \in [-31, -29]$

E. It is not possible to compose the two functions.

---

2. Choose the interval below that f composed with g at $x = -1$ is in.

$$f(x) = x^3 - 4x^2 - 4x - 2 \text{ and } g(x) = -4x^3 - 1x^2 + 2x + 2$$

A. $(f \circ g)(-1) \in [-24, -18]$

B. $(f \circ g)(-1) \in [89, 99]$

C. $(f \circ g)(-1) \in [97, 107]$

D. $(f \circ g)(-1) \in [-31, -26]$

E. It is not possible to compose the two functions.

---

3. Determine whether the function below is 1-1.

$$f(x) = -16x^2 - 24x + 247$$

A. No, because the domain of the function is not $(-\infty, \infty)$.

B. No, because there is a y-value that goes to 2 different x-values.

C. No, because there is an x-value that goes to 2 different y-values.

D. Yes, the function is 1-1.

E. No, because the range of the function is not $(-\infty, \infty)$.

---

4. Find the inverse of the function below. Then, evaluate the inverse at $x = 10$ and choose the interval that $f^-1(10)$ belongs to.

$$f(x) = e^{x+2} - 5$$

A. $f^{-1}(10) \in [-3.55, -3.34]$

B. $f^{-1}(10) \in [-3.16, -2.67]$

C. $f^{-1}(10) \in [4.47, 4.86]$

D. $f^{-1}(10) \in [-2.54, -2.41]$

E. $f^{-1}(10) \in [0.55, 0.96]$

---

5. Find the inverse of the function below (if it exists). Then, evaluate the inverse at $x = 10$ and choose the interval that $f^-1(10)$ belongs to.

$$f(x) = 2x^2 - 4$$

A. $f^{-1}(10) \in [1.77, 2.8]$

B. $f^{-1}(10) \in [2.88, 4.02]$

C. $f^{-1}(10) \in [6.38, 7.96]$

D. $f^{-1}(10) \in [0.91, 2.03]$

E. The function is not invertible for all Real numbers.

---

6. Find the inverse of the function below. Then, evaluate the inverse at $x = 7$ and choose the interval that $f^-1(7)$ belongs to.

$$f(x) = \ln(x + 5) + 3$$

A. $f^{-1}(7) \in [162755.79, 162763.79]$

B. $f^{-1}(7) \in [58.6, 61.6]$

C. $f^{-1}(7) \in [22020.47, 22024.47]$

D. $f^{-1}(7) \in [47.6, 54.6]$

E. $f^{-1}(7) \in [7.39, 11.39]$

7. Find the inverse of the function below (if it exists). Then, evaluate the inverse at $x = 14$ and choose the interval that $f^-1(14)$ belongs to.

$$f(x) = \sqrt[3]{3x - 4}$$

A. $f^{-1}(14) \in [-916.4, -914.3]$

B. $f^{-1}(14) \in [-913.6, -911.7]$

C. $f^{-1}(14) \in [914.9, 919.4]$

D. $f^{-1}(14) \in [911.6, 915.6]$

E. The function is not invertible for all Real numbers.

---

8. Add the following functions, then choose the domain of the resulting function from the list below.

$$f(x) = \frac{1}{4x + 25} \text{ and } g(x) = \frac{4}{6x - 29}$$

A. The domain is all Real numbers except $x = a$, where $a \in [5.67, 14.67]$

B. The domain is all Real numbers less than or equal to $x = a$, where $a \in [0.33, 12.33]$

C. The domain is all Real numbers greater than or equal to $x = a$, where $a \in [-8.5, -4.5]$

D. The domain is all Real numbers except $x = a$ and $x = b$, where $a \in [-15.25, -2.25]$ and $b \in [2.83, 9.83]$

E. The domain is all Real numbers.

---

9. Determine whether the function below is 1-1.

$$f(x) = (4x - 18)^3$$

A. No, because there is a y-value that goes to 2 different x-values.

B. Yes, the function is 1-1.

C. No, because there is an x-value that goes to 2 different y-values.

D. No, because the range of the function is not $(-\infty, \infty)$.

E. No, because the domain of the function is not $(-\infty, \infty)$.

---

10. Add the following functions, then choose the domain of the resulting function from the list below.

$$f(x) = 6x + 4 \text{ and } g(x) = \frac{1}{4x - 21}$$

A. The domain is all Real numbers less than or equal to $x = a$, where $a \in [-1.5, 4.5]$

B. The domain is all Real numbers greater than or equal to $x = a$, where $a \in [-6.67, -0.67]$

C. The domain is all Real numbers except $x = a$, where $a \in [4.25, 8.25]$

D. The domain is all Real numbers except $x = a$ and $x = b$, where $a \in [2.83, 7.83]$ and $b \in [-7.33, 1.67]$

E. The domain is all Real numbers.

---

11. Choose the interval below that f composed with g at $x = -1$ is in.

$$f(x) = -x^3 + 3x^2 + 4x \text{ and } g(x) = -4x^3 - 4x^2 + 4x + 3$$

A. $(f \circ g)(-1) \in [-7, -4]$

B. $(f \circ g)(-1) \in [-3, 1]$

C. $(f \circ g)(-1) \in [3, 10]$

D. $(f \circ g)(-1) \in [-12, -8]$

E. It is not possible to compose the two functions.

---

12. Choose the interval below that f composed with g at $x = 1$ is in.

$$f(x) = -2x^3 + 2x^2 - 2x \text{ and } g(x) = x^3 - 2x^2 + x$$

A. $(f \circ g)(1) \in [-0.7, 1.9]$

B. $(f \circ g)(1) \in [-16.8, -11.2]$

C. $(f \circ g)(1) \in [-5.9, -3.1]$

D. $(f \circ g)(1) \in [-19.7, -15.7]$

E. It is not possible to compose the two functions.

---

13. Determine whether the function below is 1-1.

$$f(x) = 15x^2 - 189x + 594$$

A. No, because there is an x-value that goes to 2 different y-values.

B. Yes, the function is 1-1.

C. No, because the range of the function is not $(-\infty, \infty)$.

D. No, because there is a y-value that goes to 2 different x-values.

E. No, because the domain of the function is not $(-\infty, \infty)$.

---

14. Find the inverse of the function below. Then, evaluate the inverse at $x = 8$ and choose the interval that $f^-1(8)$ belongs to.

$$f(x) = \ln(x - 2) - 5$$

A. $f^{-1}(8) \in [442414.39, 442417.39]$

B. $f^{-1}(8) \in [22016.47, 22027.47]$

C. $f^{-1}(8) \in [15.09, 25.09]$

D. $f^{-1}(8) \in [396.43, 399.43]$

E. $f^{-1}(8) \in [442405.39, 442412.39]$

---

15. Find the inverse of the function below (if it exists). Then, evaluate the inverse at $x = 15$ and choose the interval that $f^-1(15)$ belongs to.

$$f(x) = \sqrt[3]{4x - 3}$$

A. $f^{-1}(15) \in [843.5, 844.8]$

B. $f^{-1}(15) \in [-847.1, -843.8]$

C. $f^{-1}(15) \in [841.1, 843.1]$

D. $f^{-1}(15) \in [-843.1, -839.4]$

E. The function is not invertible for all Real numbers.

---

16. Find the inverse of the function below. Then, evaluate the inverse at $x = 9$ and choose the interval that $f^{-}1(9)$ belongs to.

$$f(x) = e^{x+4} - 3$$

A. $f^{-1}(9) \in [-1.44, -1.23]$

B. $f^{-1}(9) \in [-1.58, -1.46]$

C. $f^{-1}(9) \in [-0.58, -0.38]$

D. $f^{-1}(9) \in [-1.36, -1.19]$

E. $f^{-1}(9) \in [6.47, 6.65]$

---

17. Find the inverse of the function below (if it exists). Then, evaluate the inverse at $x = -11$ and choose the interval that $f^{-}1(-11)$ belongs to.

$$f(x) = \sqrt[3]{2x + 4}$$

A. $f^{-1}(-11) \in [-663.5, -660.5]$

B. $f^{-1}(-11) \in [662.5, 664.5]$

C. $f^{-1}(-11) \in [-674.5, -665.5]$

D. $f^{-1}(-11) \in [664.5, 668.5]$

E. The function is not invertible for all Real numbers.

---

18. Multiply the following functions, then choose the domain of the resulting function from the list below.

$$f(x) = 8x^2 + 8 \text{ and } g(x) = \sqrt{3x + 15}$$

A. The domain is all Real numbers greater than or equal to $x = a$, where $a \in [-6, -1]$

B. The domain is all Real numbers except $x = a$, where $a \in [0.83, 5.83]$

C. The domain is all Real numbers less than or equal to $x = a$, where $a \in [-0.6, 8.4]$

D. The domain is all Real numbers except $x = a$ and $x = b$, where $a \in [-9.67, -1.67]$ and $b \in [-3.75, 1.25]$

E. The domain is all Real numbers.

---

19. Determine whether the function below is 1-1.

$$f(x) = (5x - 18)^3$$

A. Yes, the function is 1-1.

B. No, because the range of the function is not $(-\infty, \infty)$.

C. No, because there is a y-value that goes to 2 different x-values.

D. No, because the domain of the function is not $(-\infty, \infty)$.

E. No, because there is an x-value that goes to 2 different y-values.

---

20. Add the following functions, then choose the domain of the resulting function from the list below.

$$f(x) = 9x^3 + 8x^2 + 6x \text{ and } g(x) = \sqrt{-3x + 10}$$

A. The domain is all Real numbers greater than or equal to $x = a$, where $a \in [4.5, 10.5]$

B. The domain is all Real numbers except $x = a$, where $a \in [-8.25, 0.75]$

C. The domain is all Real numbers less than or equal to $x = a$, where $a \in [3.33, 4.33]$

D. The domain is all Real numbers except $x = a$ and $x = b$, where $a \in [3.75, 5.75]$ and $b \in [-6.2, -3.2]$

E. The domain is all Real numbers.

---

21. Choose the interval below that f composed with g at $x = -2$ is in.

$$f(x) = -2x^3 - 4x^2 + x - 1 \text{ and } g(x) = -2x^3 - 3x^2 + x$$

A. $(f \circ g)(-2) \in [31, 36]$

B. $(f \circ g)(-2) \in [-34, -26]$

C. $(f \circ g)(-2) \in [24, 26]$

D. $(f \circ g)(-2) \in [-38, -35]$

E. It is not possible to compose the two functions.

---

22. Choose the interval below that f composed with g at $x = -1$ is in.

$$f(x) = 4x^3 + 4x^2 - 2x \text{ and } g(x) = 2x^3 - 2x^2 - 3x - 1$$

A. $(f \circ g)(-1) \in [-2, 7]$

B. $(f \circ g)(-1) \in [-17, -9]$

C. $(f \circ g)(-1) \in [5, 16]$

D. $(f \circ g)(-1) \in [-8, -1]$

E. It is not possible to compose the two functions.

---

23. Determine whether the function below is 1-1.

$$f(x) = (5x - 26)^3$$

A. Yes, the function is 1-1.

B. No, because the range of the function is not $(-\infty, \infty)$.

C. No, because there is a y-value that goes to 2 different x-values.

D. No, because there is an x-value that goes to 2 different y-values.

E. No, because the domain of the function is not $(-\infty, \infty)$.

24. Find the inverse of the function below. Then, evaluate the inverse at $x = 10$ and choose the interval that $f^-1(10)$ belongs to.

$$f(x) = e^{x-3} - 5$$

A. $f^{-1}(10) \in [5.61, 5.73]$

B. $f^{-1}(10) \in [-3.24, -2.83]$

C. $f^{-1}(10) \in [-0.54, -0.06]$

D. $f^{-1}(10) \in [-3.66, -3.28]$

E. $f^{-1}(10) \in [-2.64, -2.19]$

25. Find the inverse of the function below (if it exists). Then, evaluate the inverse at $x = -14$ and choose the interval that $f^-1(-14)$ belongs to.

$$f(x) = \sqrt[3]{2x - 5}$$

A. $f^{-1}(-14) \in [-1373.5, -1362.5]$

B. $f^{-1}(-14) \in [1371.5, 1375.5]$

C. $f^{-1}(-14) \in [1369.5, 1370.5]$

D. $f^{-1}(-14) \in [-1374.5, -1371.5]$

E. The function is not invertible for all Real numbers.

26. Find the inverse of the function below. Then, evaluate the inverse at $x = 5$ and choose the interval that $f^-1(5)$ belongs to.

$$f(x) = e^{x-2} - 2$$

A. $f^{-1}(5) \in [3.7, 4.98]$

B. $f^{-1}(5) \in [-0.07, 1.7]$

C. $f^{-1}(5) \in [-0.93, -0.88]$

D. $f^{-1}(5) \in [-0.93, -0.88]$

E. $f^{-1}(5) \in [-0.07, 1.7]$

---

27. Find the inverse of the function below (if it exists). Then, evaluate the inverse at $x = 10$ and choose the interval that $f^{-}1(10)$ belongs to.

$$f(x) = 4x^2 - 5$$

A. $f^{-1}(10) \in [0.71, 1.71]$

B. $f^{-1}(10) \in [3.05, 4.01]$

C. $f^{-1}(10) \in [4.69, 5.8]$

D. $f^{-1}(10) \in [1.81, 2.61]$

E. The function is not invertible for all Real numbers.

---

28. Multiply the following functions, then choose the domain of the resulting function from the list below.

$$f(x) = 9x + 7 \text{ and } g(x) = \sqrt{-3x - 9}$$

A. The domain is all Real numbers greater than or equal to $x = a$, where $a \in [-6.33, -0.33]$

B. The domain is all Real numbers less than or equal to $x = a$, where $a \in [-6, 0]$

C. The domain is all Real numbers except $x = a$, where $a \in [2.33, 8.33]$

D. The domain is all Real numbers except $x = a$ and $x = b$, where $a \in [-7.83, -1.83]$ and $b \in [1.2, 7.2]$

E. The domain is all Real numbers.

---

29. Determine whether the function below is 1-1.

$$f(x) = -12x^2 - 167x - 575$$

A. No, because the domain of the function is not $(-\infty, \infty)$.

B. No, because the range of the function is not $(-\infty, \infty)$.

C. Yes, the function is 1-1.

D. No, because there is a y-value that goes to 2 different x-values.

E. No, because there is an x-value that goes to 2 different y-values.

---

30. Add the following functions, then choose the domain of the resulting function from the list below.

$$f(x) = 3x^4 + 6x^3 + 4x^2 + 5x \text{ and } g(x) = \sqrt{-6x - 18}$$

A. The domain is all Real numbers greater than or equal to $x = a$, where $a \in [-8.83, -0.83]$

B. The domain is all Real numbers except $x = a$, where $a \in [5.33, 6.33]$

C. The domain is all Real numbers less than or equal to $x = a$, where $a \in [-7, 1]$

D. The domain is all Real numbers except $x = a$ and $x = b$, where $a \in [-1.17, 4.83]$ and $b \in [5.25, 11.25]$

E. The domain is all Real numbers.
